Devashish Khulbe

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Education

Masaryk University — Brno, Czech Republic
Ph.D., Department of Mathematics and Statistics, Faculty of Science — *Sept 2022-Current*

New York University — New York, NY
Master of Science in Applied Urban Science and Informatics — *Aug 2018 - Sep 2019*

Delhi Technological University — New Delhi, India
Bachelor of Engineering in Electrical Engineering — *Aug 2014 - Aug 2018*

Experience

Thales Group — Paris, France
Research Internship - Thales Research and Technology (TRT) — *Jan 2025 - May 2025*

- **Semantic informed and Interpretable Deep Learning for Ontology-based datasets**: At Thales R&D facility, I worked on conceptualization and development of Graph Neural Network models for ontology-based data modeling, while also developing methods to uncover interpretability in model's predictions.

Masaryk University — Brno, Czech Republic
Researcher - Digital City Lab at the Faculty of Science — *Sept 2022 - present*

- **Research Focus (advisor: Dr. Stanislav Sobolevsky)**:
  - Research on applied machine learning models on urban networks at the Department of Mathematics and Statistics
  - Primary focus is on using Graph Neural Networks (GNN) for applications in modeling complex networks. Past involved applications of probabilistic simulation models in urban science.

Center for Urban Science + Progress (CUSP), NYU — New York, NY
Research Assistant - Urban Complexity Lab and Machine Learning for Good Lab — *Jan 2019 - Dec 2019 & Mar 2020 - Aug 2022*

- **Research Focus**: Worked on developing machine learning methods for urban applications with Dr. Stanislav Sobolevsky and Dr. Daniel B. Neill as advisors at CUSP.
  - Worked on data driven research problems involving road safety analyses, urban mobility, and causal inference which incorporated variety of urban data sets and machine learning algorithms.
  - Closely worked on projects with Courant Institute of Mathematical Sciences, Center for Urban Science+Progress and NYU Wagner on building custom data sets using various APIs.
- **Teaching Assistant**: Working as a TA at CUSP (2020-2021)
  - Developed the course curriculum, lab notebooks and conducted office hours for the courses: Principles of Urban Informatics and Applied Data Science

McDevitt Lab, NYU Langone — New York, NY
Research Associate — *Jan 2020 - Aug 2020*

- **ML based trauma fatality detection**: Worked under Dr. John McDevitt in identifying critical trauma based bio-markers through data driven pattern recognition and developed machine learning models for fatality prediction on National Trauma Bank Data.

Research Publications (Preprints and Published)

- Khulbe, D. & Laudy, C. (2025). Semantic Informed and Interpretable Graph Neural Networks for Ontology based data *(working paper with Thales)*.
- Khulbe, D. & Sobolevsky, S., 2025. Urban delineation through the lens of commute networks: Leveraging graph embeddings to distinguish socioeconomic groups in cities. *arXiv preprint arXiv:2507.11057*.
- Khulbe, D., Belyi, A. and Sobolevsky, S., 2025. Commute Networks as a Signature of Urban Socioeconomic Performance: Evaluating Mobility Structures with Deep Learning Models. *arXiv preprint arXiv:2507.04027*.
- He, M., Bogomolov, Y., Khulbe, D., & Sobolevsky, S. (2023). Distance deterrence comparison in urban commute among different socioeconomic groups: A normalized linear piece-wise gravity model. *Journal of Transport Geography, 113, 103732*.
- Khulbe, D., Kang, C., Ukkusuri, S., & Sobolevsky, S. (2023). A probabilistic simulation framework to assess the impacts of ridesharing and congestion charging in New York city. *Data Science for Transportation, 5(2), 8*.
- Khulbe, D., Belyi, A., Mikeš, O., & Sobolevsky, S. (2023, June). Mobility networks as a predictor of socioeconomic status in urban systems. *International Conference on Computational Science and Its Applications (pp. 453-461)*.
- Bogomolov, Y., He, M., Khulbe, D., & Sobolevsky, S. (2021). Impact of income on urban commute across major cities in US. *Procedia Computer Science, 193, 325-332*.

Working Projects

- **Investigating transferability of deep learning based network embeddings**: This project seeks to build robust and transferable representations (embeddings) of networks, and further evaluating the network embeddings for real-world use cases.